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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,427	03/26/2004	Hiroyuki Nakamura	2004-0351A	7848
513	7590	07/29/2005	EXAMINER	
WENDEROTH, LIND & PONACK, L.L.P.			SUMMONS, BARBARA	
2033 K STREET N. W.			ART UNIT	
SUITE 800			PAPER NUMBER	
WASHINGTON, DC 20006-1021			2817	

DATE MAILED: 07/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/809,427

Applicant(s)

NAKAMURA ET AL.

Examiner

Barbara Summons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/26/04, 6/22/04 and 9/1/04 (IDS's).
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18 and 19 is/are allowed.
- 6) ☒ Claim(s) 1-15, 17 and 20 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/26 thru 9/1/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9, 17 and 20 are rejected under 35 U.S.C. § 102(b) as being anticipated by DE 100 57 848 (DE '848) cited by Applicants.

Regarding claims 1, 2, 17 and 20, Fig. 6 of DE '848 discloses a surface acoustic wave (SAW) resonator to be used in a filter (see Fig. 2) in a duplexer (see the "USE" in the English language abstract attachment 1), comprising: a piezoelectric substrate (see e.g. col. 3, line 23); an interdigital transducer (IDT); and a reflector Ref2 disposed adjacent to the IDT; and wherein the IDT comprises a plurality of first finger electrodes coupled to a first bus bar electrode BB1, and a plurality of second finger electrodes coupled to a second bus bar electrode BB2, such that the first and second plurality of finger electrodes do not overlap each other, but are acoustically coupled by a plurality of dogleg strip line electrodes to form resonating units R1 and R2 coupled in series via the strip line electrodes.

Regarding claims 3 and 4, Fig. 7a shows a variation wherein the plurality of first and second finger electrodes coupled to the upper and lower bus bars are arranged in a directly "face-to-face manner", and the first and second finger electrodes are arranged at intervals of a propagation wavelength of a SAW since this is a modification of a

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standard IDT having electrode fingers and spaces of a quarter wavelength such that two electrodes extending from a same bus bar are necessarily spaced by a wavelength (see Fig. 1 and col. 3, line 5). Regarding claims 7 and 8, the strip lines are similarly necessarily spaced by a deviation of a half wavelength from the centers of the first and second finger electrodes due to the electrodes and spaces being the standard quarter wavelength, and resonating units R1 and R2 are formed by the strip lines overlapping with the first and second finger electrodes, respectively.

Regarding claims 5, 6, and 9, Fig. 6 shows a deviation between the first finger electrodes and the second finger electrodes of a half wavelength and Fig. 8a shows a deviation of a quarter wavelength (i.e. thus providing the discussed phase relationships at col. 6, lines 46-53 and col. 7, lines 1-13).

In summary, Fig. 7a of DE '848 anticipates Applicants' Fig. 1, and Fig. 6 of DE '848 anticipated Applicants' Fig. 6.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 10-13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over DE '848 taken alone.

DE '848 discloses the invention as discussed above and also discloses an embodiment with three resonating units in Figs. 11a and 11b and with dummy electrodes in Fig. 13a.

However, Fig. 11 of DE '848 shows bus bars and does not explicitly show a first plurality of strip lines and a second plurality of strip lines (i.e. $N=2$) with the middle resonating unit being formed by the overlapping of the first and second plurality of strip lines, and Fig. 13 also shows a bus bar and no strip lines.

DE '848 does additionally disclose that it is a known variation to substitute strip lines in place of middle bus bars BBm (see Fig. 7a vs. Fig. 7b).

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the resonator of DE '848 (Figs. 11 & 13a) by having replaced the middle bus bars BBm1 and BBm2 in Fig. 11 with a first and second plurality of strip lines, respectively, and by having replaced the middle bus bar in Fig. 13a with strip lines, because such obvious modifications would have been known variations as implicitly suggested by DE '848 at Fig. 7a vs. Fig. 7b, and section [0054] of DE '848 suggests the inclusion of variations in its disclosure.

In summary, replacing the middle bus bars in Figs. 11 and 13a with strip lines, provides Applicants' Figs. 10 and 5, respectively.

5. Claims 14 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over DE '848 in view of Tsutsumi et al. U.S. 6,903,626.

DE '848 discloses the invention as discussed in the immediately preceding rejection, but does not explicitly discuss the length of the dummy electrodes and the space between the dummy electrodes and the strip lines.

Tsutsumi et al. discloses a process of optimizing a non-overlapping electrode finger portion in an IDT to between 1.0 and 4.5 times the wavelength with a dummy electrode in the space (see col. 13, lines 36-41), and provides an example wherein the length of the dummy electrodes is one wavelength (i.e. as required by claim 14) and the distance between the dummy electrode and the active electrode is a quarter wavelength (as required by claim 15) to meet the 2.5 wavelength total non-overlapping region (see col. 13, line 57-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW resonator of DE '848 (Fig. 13a), if even necessary, such that the dummy electrodes would have had the recited dimensions, because DE '848 is silent as to the dimensions thereby suggesting to one of ordinary skill that any optimal dimensions would have been usable therewith, and because such an obvious modification would have been merely an optimization based on the required application of the resonator as suggested by Tsutsumi et al. (see col.

13, lines 57-61 and col. 14, lines 22-39), and further because keeping the dimensions within certain small sizes would have provided the benefits of keeping the SAW efficiency from being degraded and not preventing downsizing as explicitly suggested by Tsutsumi et al. (see col. 14, lines 39-46).

Allowable Subject Matter

6. Claims 18 and 19 are allowable over the prior art of record.
7. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or fairly suggest a SAW filter having a plurality of IDT disposed in a propagation direction of a SAW (see claim 18, lines 3-5). DE '848 appears to only contemplate using its resonator in a ladder filter (see "Novelty" in the attached abstract and Fig. 2). Higgins (cited by Applicant) has multiple sub-transducers arranged in a propagation direction but the multi-strip coupler cannot be considered to be a part of any one IDT as recited (see claim 18, lines 10-14). Additionally, the prior art of record does not disclose or suggest a SAW resonator with dummy electrodes that are wider than the electrodes. The prior art (not cited) appears to teach dummy electrodes of substantially similar width to the electrodes facing them.

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Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Andreev et al. U.S. 4,162,415 and Bagdasarian et al. U.S. 4,355,290 and 4,393,321 each show SAW IDTs for use in filters, the IDT having first and second non-overlapping finger electrodes coupled by strip line electrodes.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bs
July 27, 2005
(1 Attachment)



**BARBARA SUMMONS
PRIMARY EXAMINER**